Letter from Thomas A. Watson to Alexander Graham Bell, December 22, 1914

Fifteen Dey Street New York December 22, 1914. Dr. Alexander Graham Bell, 1331 Connecticut Avenue, Washington, D. C. Dear Doctor Bell:-

I send you herewith a copy of the little Telephone Reminiscences play. I have altered it in conformity with your testimony and recollections and I think you will find it sufficiently accurate now. I have purposely avoided too much definiteness in the details of the arrangement of apparatus.

Arrangements are being made to send the apparatus down to Washington to your home, by which the record will be made, and Mr. Carty will undoubtedly communicate with you soon, fixing the date for it. If you desire to make any changes in the play, kindly let me know so I can change them in my copy.

I am also sending a copy of my suggestions for the Bell-Watson talk at the opening of the transcontinental line. I should be glad to have you make any changes in those that you see fit, as they are only suggestions.

I am still feeling the joy and exhilaration of the hours I spent with you and am looking forward to our work together in preparing for the talk and moving picture.

Very cordially yours, Thomas A Watson

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File under Thos A. Watson Telephone Reminiscences. (Unabridged) Perpetrated by Thos. A. Watson Characters, Alexander Graham Bell. Thomas A. Watson.

Stage Setting. A modern office with a desk and chairs (of or of the Telephone Co.'s Museum.) On the desk are models of telephone apparatus.

When the curtain rises, Watson is standing by the desk contemplating the models. Bell enters. Shakes hands with Watson.

Bell. Ah, Mr. Watson, how do you do?

Watson. I am glad to see you, Dr. Bell.

Bell. These models are interesting. Where did they come from?

W. Mr. Carty, the chief engineer of the American Telephone and Telegraph Co. has collected them or had them reproduced from your original experimental apparatus for the Panama Exposition at San Francisco.

B. (Taking up an harmonic telegraph receiver.) Here is my old harmonic telegraph receiver like those you made for me, Watson, 40 years ago!

W. And here is the transmitter that went with it.

B. They bring back to me the many hours of study and experiment I gave to the problem of making these instruments transmit several telegraph messages simultaneously over one wire.

W. Ever since the time I made them for you and helped you test them, I never see them, or a picture of them, without a vision of you sitting by my work bench in Williams' old shop in Boston, studying some new piece of the apparatus you had had me make for you, or discussing with me some improvement you had in mind which you 2 hoped would make the things work better.

B. Those were discouraging days, Watson, for I didn't realize then that they were ushering in something great — that they were the dark hours before a wonderful dawn. This receiver might well be the identical piece that, with one of those transmitters you have there, gave me the hint which solved the other problem I had been trying to work out long before I began work on the Harmonic Telegraph, that is, transmitting speech telegraphically, as I used to put it in those days.

W. I remember perfectly how enthusiastic you were over what all your friends laughed at — behind your back, — your belief that it would soon be possible to talk at one end of a telegraph wire and hear it at the other even though the wire were several miles long. I must confess I was rather skeptical myself when you told me your idea one evening we were testing your telegraph. I have never forgotten the exact words in which you formulated your theory of an electric speaking telephone. They were, “If I can make a current of electricity vary in its intensity precisely as the air varies in density during the production of a sound, I can transmit speech telegraphically”.

B. That idea has obsessed me since but every attempt I had made to devise an instrument to realize the idea practically had been quite barren until that eventful afternoon of June 2nd 1875, when the misbehavior of these harmonic telegraph instruments opened up to me the long-sought road to the achievement of a practical speaking telephone. Do you remember that afternoon, Mr. Watson?

W. Clearly! The harmonic telegraph had never worked more inharmonically. It was a hot day and the attic we were working in was baking. 3 I was feeling very lazy. After several months work for you on the telegraph apparatus, I had lost faith in the idea and was hoping you would tell me to chuck the whole thing into the scrap heap. Lucky for both of us you didn't!

B. It never entered my head then to do so. I feel sure I should have perfected it if the telephone had not absorbed almost all my attention after the discovery of June 2nd 1875.

As I remember it, this is how it happened. It was necessary to the good working of the telegraph instruments that the receiver springs should be accurately tuned to the same pitches as the transmitter springs. When I was tuning one I would press its spring against my ear, for then I could hear the pitch of the corresponding transmitter spring sending its make-and-break current through the receiver coils and could easily lengthen and shorten the receiver spring until its pitch was in exact accordance with that of the transmitter. You were attending to the transmitters as usual in one of the rooms in Williams' attic sending me the current from each as I called for it. I was alone in the other room tuning the receivers, pressing them against my ear one after the other. Suddenly the usual loud drone of the intermittent current in my receiver stopped and in its stead I heard an exceedingly faint twang, repeated several times, that had the perfect timbre of the sound of one of the transmitter springs. I was startled and could hardly believe my ears for I knew no human being had ever before heard a real sound transmitted by an electric current. I rushed into your room to see what was going on there.

W. You started me out of the lethargy into which the hot weather and the wretched working of the telegraph apparatus had plunged me. I was just then more disgusted with the things than ever for a new trouble had developed at my end of the line. One of the transmitter springs, which you, of course, remember was kept in vibration by make and break 4 contact points, suddenly stopped buzzing. I gave it a vicious pluck to start it. It didn't start and I kept on plucking it when I heard a shout from your room and out you rushed demanding what I was doing. I didn't know what I had been guity of, but we looked it over and found that the contact points of that transmitter spring had stuck together so it didn't bake and break the current and cause the usual howl in your receiver. As soon as I saw I wasn't to blame I asked you what had happened in your room that had made you so excited.

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Bell. No wonder I was excited. Those sticking contact points had solved the problem I had been struggling with for years. As I said before, I had heard in the receiver I was pressing

against my ear the actual sound of the spring you were plucking. It was extremely faint but it had not merely the pitch of the spring but all its overtones giving the full timbre of the spring as if it had been heard through the air. I realized the full import of the event and rushed out into your room to see what had produced this new and startling effect. It didn't require much study to see what had occurred. That little strip of steel clock spring had become magnetized by its previous use and its vibration over the pole of its electro-magnet was generating an electric current that realized my old theory, which I had explained to you months before, of an undulatory or sound — transmitting current that varied in its intensity precisely as the air varies in its density during the production of a sound. The thought came to me at once that if this simple apparatus could transmit one sound perfectly it could by some modification be made to transmit any sound, even that of the voice.

Watson. Your excitement drove that tired feeling out of me and you kept me plucking springs and making various combinations all that afternoon. Just before we finished work you made a rough sketch of the fist speaking telephone which I was to construct as soon as I possibly could.

Bell. This is a model of the very instrument. I directed you to take one of the harmonic receivers, attach a tightly stretched drumhead to the free end of its spring and arrange a mouthpiece to direct the voice against the other side of the drumhead. It seemed to me that I could in this way force the spring to follow all the complex vibrations of the 6 voice instead of merely vibrating at its own normal rate.

Watson. Your enthusiasm aroused mine. I took your sketch, rushed it through to completion and had it ready the very next day. That evening we tested it together in the attic rooms at 109 Court Street, Boston. It was far from perfect but it worked well enough at that first test to prove your theory correct. June 2nd, 1875 really was the birthday of the telephone and all your hard and constant experimenting upon it during the next two years until it was put into commercial use, was entirely a matter of working out its details.

Bell. Another great day was Oct. 9th, 1876 when I felt I had my telephone working well enough to try it on a real live wire.

Watson. You got permission from the Walworth Mfg. Co. to use their telegraph wire, 2 miles long running from their office in Boston to their factory in Cambridge. I was at Cambridge that evening. When I connected the telephone and listened I couldn't hear a word though you said you would keep talking until I answered, but I found something wrong with the wire at my end. After I had fixed it rushed back to the telephone and then I heard your voice louder than I had ever heard it in the laboratory experiments shouting ahoy! ahoy! Watson, Are you there? Do you hear me? I answered back and then began the first talk over a real wire-the first long-distance telephoning.

Bell. We recorded our conversation that night and it was published in the next morning's paper with head lines in big type. The success of that experiment was one of the greatest joys of my telephone experimenting. I knew then that the telephone was ready for the world's service.

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When I talked from N. Y. the other day to you in San Francisco over a line 3400 hundred miles long, I remembered my joy when I heard your voice 40 years before over a wire 2 miles long, and I thought of the immense and constant work that the engineers and inventors of the Bell Telephone companies must have carried on to make this marvelous achievement.

Watson. I wonder to what further heights they will attain?

Bell. I am sure other great things will come. This is not the end of their achievements in telephony, but I am very glad I have lived long enough to have seen this.

(They shake hands and the picture closes)